

indicate that overlapping transmissions are allowed. The other values may be distributed between access nodes of neighbouring or overlapping wireless networks in a determined manner in order to enable a terminal device to identify an access node of its own wireless network from the field. Accordingly, the terminal device may carry out overlapping transmissions upon detecting a value that allows the overlapping transmissions and is not a value used by the access node of its own wireless network. Upon detecting a value that allows the overlapping transmissions and is the value used by the access node of its own wireless network, the terminal device may prevent the overlapping transmission. The access nodes may negotiate about the values or a centralized controller may allocate a unique value for each access node. The SIG field may further comprise parameters enabling a receiver of the frame to decide under which circumstances the channel is considered to be busy and the overlapping transmission shall not be triggered even though the field indicates allowance of the overlapping transmissions. For example, if the terminal device 112 detects a frame that allows overlapping transmissions but that the frame is an uplink transmission to the access node 100, the terminal device may prevent overlapping transmission to the access node 100. Similarly, the terminal device may prevent overlapping transmission with the access node of its own access node.

[0032] In general, two wireless networks 120, 122 having overlapping coverage areas may enable overlapping transmissions. Accordingly, a device of a first wireless network may be allowed to transmit simultaneously with a device of a second wireless network. This may improve channel utilization and spectral efficiency but it may cause problems because a receiver of the first wireless network may experience interference from the second wireless network as stronger than the transmitting device of the first wireless network. Accordingly, throughput may be decreased under some scenarios.

[0033] FIGS. 2A and 2B illustrate procedures for preventing transmissions that are potentially interfered in the case where overlapping transmissions are allowed between devices of two different wireless networks. The process may be carried out between two apparatuses of the same wireless network, e.g. between an access node 100 and a terminal device 112 or 114 or between two terminal devices 112 and 114. FIG. 2A illustrates a viewpoint of an apparatus (Apparatus 1) that prohibits another apparatus to carry out overlapping frame transmissions, and FIG. 2B illustrates a viewpoint of an apparatus (Apparatus 2) that refrains from overlapping frame transmissions. Referring to FIG. 2A and according to an aspect, the process comprises in an apparatus of a first wireless network: detecting on the basis of a first criterion that transmissions performed simultaneously with an apparatus of a second wireless network are allowed (block 200); determining, on the basis of a second criterion different from the first criterion, to prohibit frame transmissions simultaneously with the apparatus of the second wireless network (block 202); upon said determining, causing transmission of a control message in the first wireless network, wherein the control message comprises an instruction to refrain from transmissions simultaneously with the apparatus of the second wireless network (block 204).

[0034] According to another aspect, the process of FIG. 2B comprises in an apparatus of the first wireless network: detecting that transmissions performed simultaneously with an apparatus of a second wireless network are allowed (block 200); determining, on the basis of a set of rules comprising at

least one rule, that a frame transmission, simultaneous with a frame transmission of the apparatus of the second wireless network, to a third apparatus of the first wireless network is prohibited (block 206); and in response to said determining, refraining the transmission to the third apparatus at least for the duration of the frame transmission of the apparatus of the second wireless network (block 208). The embodiment of FIG. 2A enables the Apparatus 1 to instruct one or more other devices of the first wireless network to refrain from simultaneous frame transmissions in a situation where there is an on-going frame transmission from a source of the second wireless network that is considered to interfere with frame reception in an apparatus of the first wireless network and in a situation where overlapping transmissions with the source are allowed, e.g. through the Color scheme described above. Accordingly, the devices of the first wireless network will not attempt an overlapping transmission that will probably be received erroneously or not detected at all in an intended receiver. The intended receiver may be the Apparatus 1 or another apparatus of the first wireless network. This type of prevented overlapping transmission further saves the power of the devices of the first wireless network. In some embodiments described below, one or more of the devices of the first wireless network may be configured to enter a power-save mode for the duration of such an interfering transmission to further save power.

[0035] The embodiment of FIG. 2B enables the Apparatus 2 to prevent simultaneous frame transmissions in the above-described situation. The rules may be pre-defined rules, e.g. provided by an access node of the first wireless network, as described below.

[0036] In an embodiment, block 200 is based on detecting a frame from the apparatus of the second wireless network, wherein the frame comprises an information element explicitly allowing overlapping frame transmissions, e.g. the Color field having a value indicating allowed overlapping transmissions. As a consequence, the first criterion is the detection of the explicit indication of allowance from the apparatus of the second wireless network.

[0037] In another embodiment, block 200 is based on channel measurements performed in connection with the CCA procedure or a similar measurement procedure. The apparatus(es) executing block 200 may measure radio energy present in a channel and identify a transmitter of the radio energy, e.g. by extracting an identifier from a header of a frame associated with the radio energy. If the radio energy is below a determined threshold, e.g. a CCA threshold, the apparatus may determine that the overlapping transmissions with the identified transmitter are allowed. On the other hand, if the radio energy is above the determined threshold, e.g. the CCA threshold, the apparatus may determine that the overlapping transmissions with the identified transmitter are not allowed. Each apparatus performing block 200 in a system, e.g. in the first wireless network, may employ the same threshold, or the threshold may be a dynamic parameter in which case different apparatuses may employ different thresholds. In this embodiment, the apparatuses may use detection of the NAV as an additional factor for determining whether or not the overlapping transmissions are allowed, or the apparatuses may disregard any NAV detected. In this embodiment, the first criterion is comparison of the channel measurements with the threshold.

[0038] Yet another embodiment is a combination of the channel measurements and the detection of the frame from